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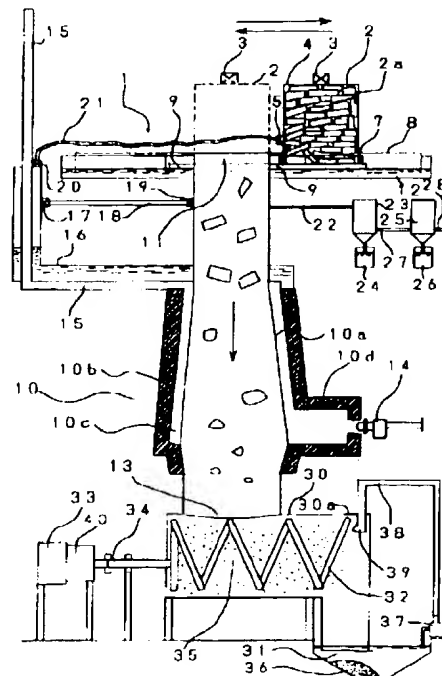
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(54) 【発明の名称】 連続式乾留装置

(57) 【要約】 (修正有)

【目的】 乾留の作業効率と乾留効率を向上させ、酸性度の低い乾留ガスの製造を可能とし、塵あいの逸散の防止を計る

【構成】 上部に乾留材2aの入口11を設け下部に出口13を設けた縦長の乾留加熱缶10と、この乾留加熱缶10の側部に設けられ乾留材を乾留するための熱を供給する加熱器14と、この加熱器14からのガスの熱により水蒸気を発生して乾留加熱缶10に水蒸気を供給する水蒸気発生器16と、乾留加熱缶10から燃焼ガスを排出する排気部30と、乾留加熱缶10から乾留ガスを排出する乾留ガス導管22と、乾留加熱缶10の入口11を密閉するように設けられ、横方向に移動できる乾留材投入用の開閉可能な移動蓋2を設けている。乾留加熱缶10の出口13に連結する排出部30を設け先端を水没させて、この排出部30の内部空間に水を噴霧出来る噴霧器39を設けている



【特許請求の範囲】

【請求項1】 上部に乾留材の入口を設け下部に出口を設けた縦長の乾留加熱缶と、この乾留加熱缶の側部に設けられ前記乾留材を乾留するための熱を供給する加熱器と、この加熱器からのガス熱により水蒸気を発生して前記乾留加熱缶に水蒸気を供給する水蒸気発生器と、前記乾留加熱缶から乾留ガスを排出する排気部と、前記乾留加熱缶の前記入口を密閉するように設けられ、横方向に移動できる乾留材投入用開閉可能な移動缶と、前記乾留加熱缶の出口と連結し乾留残さいを排出するための気密状の排出部とを設けたことを特徴とする連続式乾留装置

【請求項2】 水槽を前記入口に接続し、前記移動缶から遮蔽容器を延出させて、この遮蔽容器を水槽の水に水没させることを特徴とする請求項1の連続式乾留装置

【請求項3】 前記排出部の先端を水没させて、この排出部の内部空間に水を噴霧出来る噴霧器を設けてなることを特徴とする請求項1の連続式乾留装置

【請求項4】 前記排出部に乾留残さいを押し出すための螺旋体を設け、この螺旋体を回転させるための回転駆動源を前記螺旋体に接続し、乾留残さいの押出方向と略反対方向に噴霧できるように前記噴霧器を前記排出部に設置してなることを特徴とする請求項3の連続式乾留装置

【請求項5】 前記排出部に乾留残さいを押し出すための螺旋体を設け、この螺旋体内部に冷却水の通路を貫設し、その外周を保温材で覆ってなることを特徴とする請求項1の連続式乾留装置

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は、薪材、竹材、廃タイヤ等の乾留材をチップ化することなく、連続的に乾留する連続式乾留装置に関するものである

【0002】

【従来の技術】 従来の乾留装置では、乾留装置に投入した乾留材を密閉した状態で乾留させ、処理後は赤熱した炭化物を冷まらずに赤熱した状態で取り出すか、あるいは、自然冷却するまで待って、再び乾留材を投入していた。また、原材料をチップ化して空気を送り込んで乾留材を燃焼させる装置がある

【0003】

【発明が解決しようとする課題】 上記した通り、従来の乾留装置では、赤熱した炭化物を取り出すか、冷却するまで待つて、原材料と交換しなければならず、作業の安全性や作業効率問題があった。また、乾留材をチップ化する作業が繁雑であり、また、空気を送って燃焼させていると、酸性度の低い乾留ガスが得られず、そして、乾留加熱缶の中央部では伝熱が十分でない乾留が十分行われないうような問題が生じている。さらに、空气中に塵も

いが放出されるという問題が生じていた

【0004】 そこで、本発明は、乾留の作業効率と乾留効率を向上させ、酸性度の低い乾留ガスの製造を可能とし、塵埃の逸散の防止を計ることを目的とするものである

【0005】

【課題を解決するための手段】 本発明は、上部に乾留材の入口を設け下部に出口を設けた縦長の乾留加熱缶と、この乾留加熱缶の側部に設けられ前記乾留材を乾留するための熱を供給する加熱器と、この加熱器からのガス熱により水蒸気を発生して前記乾留加熱缶に水蒸気を供給する水蒸気発生器と、前記乾留加熱缶から乾留ガスを排出する排気部と、前記乾留加熱缶の前記入口を密閉するように設けられ、横方向に移動できる乾留材投入用開閉可能な移動缶と、前記乾留加熱缶の出口と連結し乾留残さいを排出するための気密状の排出部とを設けたことを特徴とする連続式乾留装置を要旨としている

【0006】 水槽を前記入口に接続し、前記移動缶から遮蔽容器を延出させて、この遮蔽容器を水槽の水に水没させてなることが好ましい

【0007】 前記排出部の先端を水没させて、この排出部の内部空間に水を噴霧出来る噴霧器を設けてなることが好ましい

【0008】 前記排出部に乾留残さいを押し出すための螺旋体を設け、この螺旋体を回転させるための回転駆動源を前記螺旋体に接続し、乾留残さいの押出方向と略反対方向に噴霧できるように前記噴霧器を前記排出部に設置してなることが好ましい

【0009】 前記排出部に乾留残さいを押し出すための螺旋体を設け、この螺旋体内部に冷却水の通路を貫設し、その外周を保温材で覆ってなることが好ましい

【0010】

【実施例】 以下、本発明の実施例の連続式乾留装置1を図1ないし図3に基づいて説明する。図1の連続式乾留装置1の上部には、薪材、竹材、廃タイヤ等の乾留材を投入するための円筒状の移動缶2が設けられており、移動缶2の上面には開閉可能な蓋4がロック結合しており、図示せぬ油圧装置により開閉されるようになっている。移動缶2は、一度に大まかに切砕された廃タイヤを100kg程度、収容できる大きさになっている。蓋4には逃がし弁3が設けられ、移動缶2内のガスが高圧になったときは、内部ガスを外部に開放し、圧力上昇を防止している。また、移動缶2の側部には、蒸気注入弁5が設けられ、蒸気を移動缶2に注入できるようになっており、移動缶2内の空気を蒸気で押し出して、置換できるようにになっている。図2に示すように、移動缶2の下側部には、移動コックを有する移動具6が取り付けられて、移動が円滑となるようにしている。図1に示すように、移動缶2の上端周囲にはリング状のガス漏れ防止のためのパッキン7が取り付けられ、パッキン7のす

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下部から長方形の下側が開放され、遮蔽容器8が設けられ、先端が水没できるようになっている。移動缶2の下側において、遮蔽容器8に覆われた長方形のスライダガイド9が乾留加熱缶10の上部の入口11の周囲から外方に延び出している。スライダガイド9の下側において、上部が開放されている水槽12が乾留加熱缶10の上部の入口11の周囲から外方に延び出しており、移動缶2が缶10のよう移動しても、遮蔽容器8の下部が故障なく移動できる長さとなっており、かつ、遮蔽容器8が常に水槽12の水に水没しているような深さとなっており、乾留加熱缶10のガスが外部に漏れないようになっており、乾留加熱缶10の入口11は、完全に密閉された構造となっている。図1で移動缶2が一点鎖線で示す位置に移動して、移動缶2の蓋4が閉じている限り、密閉状態が保たれて、常時、乾留加熱缶10の入口11は、完全に密閉された構造となっており、外気が入ることのない、内部ガスが漏れることもないようになっている。

【0011】乾留加熱缶10は縦長の金属製筒体10aを有しており、前述のように上部に入口11を持ち、また、下部に出口13をもち、金属製筒体10aの周囲は断熱材からなる保温体10bで覆われて両者の間には円環状の空隙10cが形成されて、保温体10bの側部10dには、バーサ14が設けられており、火炎を伴った燃焼流を空隙10cに吹き込み、下方から上方に向かって流し、金属製筒体10aを加熱するようになっている。保温体10bの上端部には、排出パイプ15が接続されており、最初は水平に、次に垂直上方に延び出し、保温体10bからの乾留を終えた燃焼流を外部に排出できるようになっている。排出パイプ15を覆うように設けられている、下部に水を貯蔵している蒸気発生器16が乾留加熱缶10と排出パイプ15に接続されており、排出パイプ15を通過する燃焼流の熱を利用して、蒸気を発生し、上部から蒸気注入弁17、蒸気パイプ18、蒸気注入弁19を介して、乾留加熱缶10の金属製筒体10aに蒸気を供給すると共に、上部から蒸気注入弁20、蒸気供給パイプ21、蒸気注入弁22を介して、蒸気を移動缶2内にも供給できるようにしている。蒸気注入弁17の反対側の金属製筒体10aの部分からは、乾留ガス導管23が延び出しており、乾留ガスと水蒸気を排出できるようになっている。この乾留ガスと水蒸気はガス冷却器24で冷却されて、油水分離タンク24で油水を分離し、パイプ27を介してガス冷却器23と接続しているガス冷却器25で再び冷却され、油水分離タンク26で処理され、取出口28から乾留ガスを取り出せるようになっている。この乾留ガスは、燃焼可能であることから、バーサ14のところに供給して再循環させることも可能である。

【0012】乾留加熱缶10の出口13に排出筒30が気密状態で水平に接続されており、排出筒30の右端

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は、直角に下方に折れ曲がっており、その先端は貯水槽31の水に沈められており空気が入ってこないようになっている。したがって乾留は気密状態で行われるようになっている。排出筒30の水平部には、螺旋体32が水平に配置されており、排出筒30の水牛部分の長さのほぼ半ばを占める程度に設けられている。この螺旋体32の左端には減速器が付き、モータ33の軸34と連結されており、螺旋体32が回転可能となっている。乾留材が乾留された後に発生する炭化物等が残さば、右方向に押し出して、貯水槽31に残さば、右端に堆積できるようになっており、塵埃の発生を防いでいる。貯水槽31から高圧ポンプ37により水をくみ上げて、パイプ38を介して噴霧弁39に水を供給している。噴霧弁39が排出筒30の折曲部30aの右端に設けられ、そこから螺旋体32に対して噴霧するようになっている。噴霧弁39は、残さい35を押し出されて、一方と反対方向に噴霧するようになり、噴霧された水は、高温の赤熱された残さい35と接触してそれを冷却すると同時に、熱交換により、水蒸気となることで、乾留加熱缶10の出口13から上方に向かって吹き上げられて、さらに加熱されて、過熱水蒸気となり、金属製筒体10aの中央部の温度の低い部分を吹き上げることにより、塵埃やバーサ14がほぼ均等に乾留されることとなり、乾留効率を高めるようになっている。図3に示すように、螺旋体32は二重構造となっており、芯として冷却水を通水するための螺旋状の金属製の冷却筒32aを設けており、これにより、残さい35の高温により熱変形することのないようになっている。冷却水は冷却水供給部40から供給され、通路32bを通過して左側から右側に流れ、右先端より外部に滴下するようになっている。冷却筒32aを覆う断熱材からなる保温体32cを巻いているのは、冷却筒32aの冷却により残さい35の温度が低下しないようにするためである。

【0013】次に本実施例の動作について説明する。図3の状態、バーサ14に点火し、空隙10cに燃焼流を送り、金属製筒体10aが高温になるように加熱させ、蒸気発生器16で蒸気を発生させて、蒸気注入弁17、19を開放して、蒸気を金属製筒体10aに送る。一方、蒸気注入弁5は閉じられていて、このとき、蒸気は移動缶2には供給されていない。モータ33を始動させて軸34を介して螺旋体32を回転させると共に、高圧ポンプ37を始動させて、水を噴霧弁39に供給し、螺旋体32に噴霧する。このようにして乾留が準備ができたら、移動缶2の蓋4を開けて、塵埃やバーサ100K程度を収容し蓋4を閉める。その後、蒸気注入弁5により、蒸気が移動缶2に供給され、塵埃やに随伴する空気が逃げ弁3から外部に排出されて、塵埃やに随伴する空気も水蒸気に置換されることから、乾留加熱缶10の爆発を防止している。次に、塵埃や2a

の乾留が高率で行われる。次に、蒸気注入管5を開閉してから、図2の移動部6の動きによりスライダガイド9に沿って移動部2を右方向に水平に移動させて、移動部2と金属製筒体10aが連通するような位置にする。、
 10 魔タイヤ2aが金属製筒体10aの内部空間を自然落下し、その間に、熱水蒸気で乾留される。また、移動部2が矢印のように移動しても、常に、遮蔽容器8が本槽12の水に水没しており、完全な密封性を確保できる。

【0014】移動部2は、再び図1の位置まで戻されて、再び魔タイヤ2aが移動部2に充填され、乾留加熱部10bで移動する。このように、移動部2は、左右への移動で、魔タイヤ2aの落下とを繰り返すことになり、高率に、魔タイヤ2aを乾留できることとなる。

【0015】乾留は、バーナ14から炎を作った燃焼流を空路10cに吹き送るので、下方から上方に向かって流し、金属製筒体10aを加熱して排出パイプ15により保温体10bからの乾留を終った燃焼流を外部に排出し、そのとき、排出パイプ15を通過する燃焼流の熱によって、蒸気発生器16が蒸気を発生し、上部から蒸気注入管17、蒸気パイプ18、蒸気注入管19を介して、乾留加熱部10の金属製筒体10aに蒸気を供給する。乾留ガス導管22から乾留ガスを排出し、これらのガスはガス冷却器23、25で冷却されて、油水分離タンク24、26で油水を分離され、取出口28から乾留ガスが取り出される。移動部2が右端で、魔タイヤ2aを供給した後、蓋4を開いたときだけ、蒸気注入管20、蒸気供給パイプ21、蒸気注入管5を介して、移動部2に蒸気を注入する。

【0016】排出筒30内では、螺旋体32が回転して、乾留材が乾留された後に発生する灰化物等の残さい35を右方向に押し出して、貯水槽31に残さい36として堆積できるようにしている。貯水槽31から高圧ポンプ37により水をくみ上げて、噴霧弁39は、残さい35が押し出されてくる方向と反対方向に噴霧するようになっており、噴霧された水は、高温の残さい35と接触して、蒸気になり、乾留加熱部10の出口から上方に向かって吹き上げられて、金属製筒体10aの中央部の温度の低い部分に供給されることにより、乾留効率を高める。螺旋状の金属製の冷却筒32aと、この冷却筒32aを覆う断熱材からなる保温体32bとにより、残さい35が高温に耐えることができる。このようにして、本実施例は、乾留加熱部10が側部から蒸気の供給を受け側部から排気ガスを排出しつつ、その上下部分が密閉状態で、連続的に魔タイヤ2aを自然落下させて乾留することが出来るのである。

【0017】以上、本実施例を説明したが、本発明の技術的思想を逸脱しない範囲で本発明の構成を適宜変更できることは当然である。移動部1の移動構造は実施例に限定されることはなく、適宜変更可能である。螺旋体32は実施例の形状や構造のものに限定されることはな

く、例えば、マグネットのように、軸力をもつものを含むことは当然である。入口11に接触感知センサーや超音波センサーや電圧センサーを設け、入口11付近に魔タイヤ2aが詰まって引掛かっていることを検出して、移動部2の戻りを停止できるようにしても良い。

【0018】

【発明の効果】以上説明したように、上部に乾留材の入口を設け下部に出口を設け、縦長の乾留加熱部、この乾留加熱部の側部に設けられ前記乾留材を乾留するための熱を供給する加熱器と、この加熱器からのガスの熱により水蒸気を発生して前記乾留加熱部に水蒸気を供給する水蒸気発生器と、前記乾留加熱部から乾留ガスを排出する排気部と、前記乾留加熱部の前記入口を密閉するように設けられ、横方向に移動できる乾留材投入用の開閉可能な移動部と、前記乾留加熱部の出口と連結し乾留残さいを排出するための気密状の排出部とを設けるので、乾留材の投入作業効率が向上し、乾留残さいが自動的に処理され、また乾留材を粗大に分割するだけで良し、チップ化する作業が不要となる。乾留材の投入時に随伴するガスを水蒸気で置換することできるので、安全性を高めることができる。ともに酸性度の低い乾留ガスが得られ、さらに、気中の塵埃の放出が防止できる。

【0019】本槽を前記入口に接続し、前記移動部から遮蔽容器を延出させて、この遮蔽容器を本槽の水に水没させてなるので、気密性を確保でき、乾留効率が高まる。

【0020】前記排出部の先端を水没させて、この排出部の内部空間に水を噴霧出来る噴霧器を設けてなるので、赤熱した灰化物の熱を利用して加熱蒸気を作りだし、これを乾留加熱部に吹き上げていることから、乾留加熱部の周囲と中央部とで、均一な乾留が可能となる。

【0021】前記排出部に乾留残さいを押し出すための螺旋体を設け、この螺旋体を回転させるための回転駆動源を前記螺旋体に接続し、乾留残さいの押出方向と略反対方向に噴霧できるように前記噴霧器を前記排出部に設置してなるので、乾留加熱部の周囲と中央部とで、均一な乾留が可能となる。

【0022】前記排出部に乾留残さいを押し出すための螺旋体を設け、この螺旋体内部に冷却水の通路を貫設し、その外周を保温材で覆ってなるので、螺旋体の熱変形が防止でき耐久性が向上する。

【0023】

【図面の簡単な説明】

【図1】 本実施例の一部断面正面図である

【図2】 本実施例の平面図である

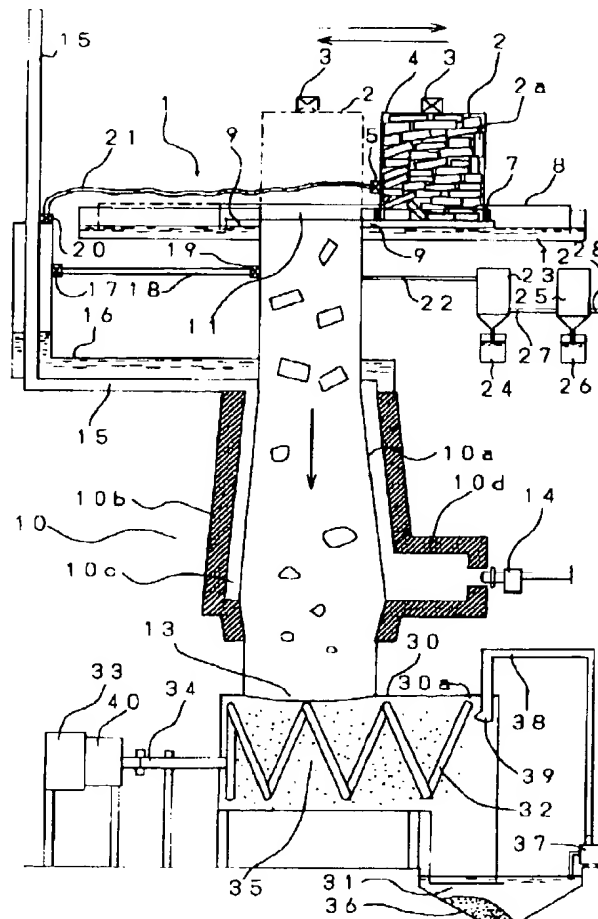
【図3】 本実施例の螺旋体の断面図である

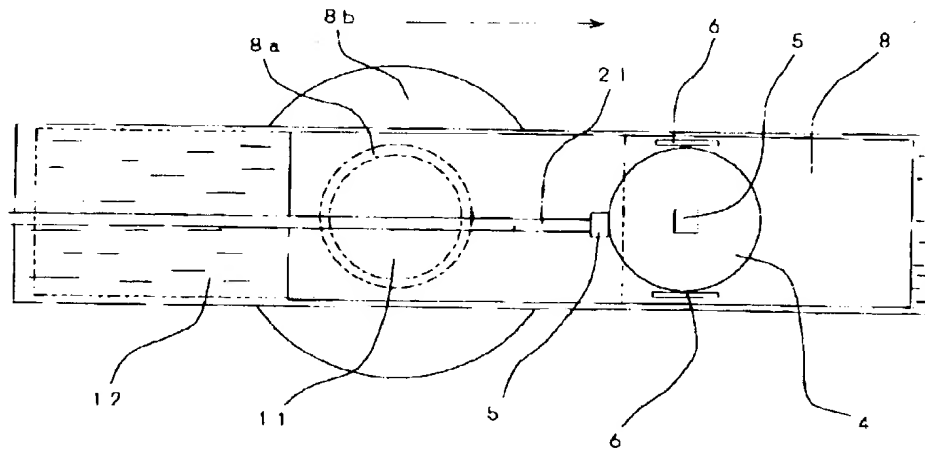
【符号の説明】

- 1 連続式乾留装置
- 2 移動部
- 3 遮がし弁

4	蓋	* 18, 21	蒸気供給パイプ
5	蒸気注入弁	22	乾留ガス導管
6	移動具	23, 25	ガス冷却器
7	パッキング	24, 26	油水分離タンク
8	遮蔽容器	28	取出口
9	フライドガイド	30	排出筒
10	乾留加熱室	31	貯水槽
11	入口	32	螺旋体
12	水槽	33	モータ
13	出口	34	軸
14	パナ	35, 36	残さ
15	排気パイプ	37	高圧ポンプ
16	蒸気発生器	38	パイプ
17, 19, 20	蒸気注入弁	* 39	噴霧弁

【図1】





【従来の技術】従来の乾留装置では、乾留装置に投入した乾留材を密閉した状態で乾留させ、処理後は赤熱した

【補正内容】

【0003】

【発明が解決しようとする課題】 しかしたから、従来の乾留装置では、赤熱した炭化物を取り出すか、冷却するまで待って、原材料と交換しなければならず、作業の安全性や作業効率に問題があった。また、乾留料をチップ

化する作業が繁雑であり、また、空気を送って燃焼させていては、酸性度の低い乾留ガスが得られず、そして、乾留加熱缶の中央部では伝熱が十分でなく乾留が十分行われないといった問題も生じている。さらに、気中に塵埃が放出されるといった問題が生じていた。

本発明は、上記の課題を解決する。

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(72)発明者 高見 英三

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the continuous carbonization equipment continuously distilled dryly, without chip-izing dry distillation material, such as firewood material, a cane, and a waste tire.

[0002]

[Description of the Prior Art] With conventional dry distillation equipment, it was made to distill dryly, where the dry distillation material supplied to dry distillation equipment is sealed, and after processing supplied dry distillation material again as **** until it took out in the condition of having burned without cooling red-hot carbide or cooled naturally. Moreover, there is equipment which a raw material is chip-ized [equipment], and air is sent [equipment] in and burns dry distillation material.

[0003]

[Problem(s) to be Solved by the Invention] However, with conventional dry distillation equipment, it had to wait until it took out red-hot carbide or cooled, and it had to exchange for the raw material, and there were the safety and working efficiency problem of an activity. Moreover, the activity which chip-izes dry distillation material is complicated, and if air is sent and is burned, carbonization gas with low acidity was not obtained, but the problem that the center section of the dry distillation heating can is not enough as heat transfer, and dry distillation is not performed enough is also produced. Furthermore, the problem that dust was emitted into mind had arisen.

[0004] Then, this invention raises the working efficiency and dry distillation effectiveness of dry distillation, enables manufacture of carbonization gas with low acidity, and aims at measuring prevention of the fly off of dust.

[0005]

[Means for Solving the Problem] The longwise dry distillation heating can which this invention established the inlet port of dry distillation material in the upper part, and established the outlet in the lower part, The heater which supplies the heat for being prepared in the flank of this dry distillation heating can, and distilling said dry distillation material dryly, The steam generator which generates a steam with the heat of the gas from this heater, and supplies a steam to said dry distillation heating can, The migration can which is prepared so that the exhaust air section which discharges carbonization gas from said dry distillation heating can, and said inlet port of said dry distillation heating can may be sealed, and can move to a longitudinal direction and in which the closing motion for the dry distillation material charge is possible, The continuous carbonization equipment characterized by preparing the airtight blowdown section for connecting with the outlet of said dry distillation heating can, and discharging dry distillation residua is made into the summary.

[0006] It is desirable to connect a cistern to said inlet port, to make an electric shielding container extend from said migration can, and to make this electric shielding container come to sink in the water of a cistern.

[0007] It is desirable to come to prepare the sprayer which the head of said blowdown section is sunk

and can spray water on the building envelope of this blowdown section.

[0008] It is desirable to install said sprayer in said blowdown section, and to become so that the spiral for extruding dry distillation residua may be prepared in said blowdown section, the revolution driving source for rotating this spiral may be connected to said spiral and it can spray on the direction of extrusion and the abbreviation opposite direction of dry distillation residua.

[0009] It is desirable to prepare the spiral for extruding dry distillation residua in said blowdown section, to install the path of cooling water through the interior of this spiral, and to come to cover that periphery with heat insulating material.

[0010]

[Example] Hereafter, the continuous carbonization equipment 1 of the example of this invention is explained based on drawing 1 thru/or drawing 3. The migration can 2 of the shape of a cylinder for supplying dry distillation material, such as firewood material, a cane, and a waste tire, is formed in the upper part of the continuous carbonization equipment 1 of drawing 1, the lid 4 which can be opened and closed is carrying out hinge association on the top face of the migration can 2, and it is opened and closed by the hydraulic system which is not illustrated. The migration can 2 is made into the magnitude which can hold about 100kg of waste tires cut roughly at once. When a relief valve 3 is formed in a lid 4 and the gas in the migration can 2 becomes high voltage, internal gas was opened outside and the pressure buildup is prevented. Moreover, the steamy impregnation valve 5 is formed, a steam can be poured now into the migration can 2, and the air in the migration can 2 is extruded to the flank of the migration can 2 with a steam, and can be permuted now by it. The migration implement 6 which has a migration roller is attached in the bottom section of the migration can 2, and it is made smooth [migration], as shown in drawing 2.

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CLAIMS

[Claim(s)]

[Claim 1] The longwise dry distillation heating can which established the inlet port of dry distillation material in the upper part, and established the outlet in the lower part, The heater which supplies the heat for being prepared in the flank of this dry distillation heating can, and distilling said dry distillation material dryly, The steam generator which generates a steam with the heat of the gas from this heater, and supplies a steam to said dry distillation heating can, The migration can which is prepared so that the exhaust air section which discharges carbonization gas from said dry distillation heating can, and said inlet port of said dry distillation heating can may be sealed, and can move to a longitudinal direction and in which the closing motion for the dry distillation material charge is possible, Continuous carbonization equipment characterized by preparing the airtight blowdown section for connecting with the outlet of said dry distillation heating can, and discharging dry distillation residua.

[Claim 2] Continuous carbonization equipment of claim 1 characterized by connecting a cistern to said inlet port, making an electric shielding container extend from said migration can, and making this electric shielding container come to sink in the water of a cistern.

[Claim 3] Continuous carbonization equipment of claim 1 characterized by coming to prepare the sprayer which the head of said blowdown section is sunk and can spray water on the building envelope of this blowdown section.

[Claim 4] Continuous carbonization equipment of claim 3 characterized by installing said sprayer in said blowdown section, and becoming so that the spiral for extruding dry distillation residua may be prepared in said blowdown section, the revolution driving source for rotating this spiral may be connected to said spiral and it can spray on the direction of extrusion and the abbreviation opposite direction of dry distillation residua.

[Claim 5] Continuous carbonization equipment of claim 1 characterized by preparing the spiral for extruding dry distillation residua in said blowdown section, installing the path of cooling water through the interior of this spiral, and coming to cover that periphery with heat insulating material.

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can spray water on the building envelope of this discharge section.

[0008] It is desirable to install said sprayer in said discharge section, and to become so that the screw for extruding dry distillation residua may be prepared in said discharge section, the rotation driving source for rotating this screw may be connected to said screw and it can spray on the direction of extrusion and the abbreviation opposite direction of dry distillation residua.

[0009] It is desirable to prepare the screw for extruding dry distillation residua in said discharge section, to install the path of cooling water through the interior of this screw, and to come to cover that periphery with heat insulating material.

[0010]

[Example] Hereafter, the continuous carbonization equipment 1 of the example of this invention is explained based on drawing 1 thru/or drawing 3. The migration can 2 of the shape of a cylinder for supplying dry distillation material, such as firewood material, a cane, and a waste tire, is formed in the upper part of the continuous carbonization equipment 1 of drawing 1, the lid 4 which can be opened and closed is carrying out hinge association on the top face of the migration can 2, and it is opened and closed by the hydraulic power unit which is not illustrated. The migration can 2 is made into the magnitude which can hold about 100kg of waste tires cut roughly at once. When a relief valve 3 is formed in a lid 4 and the gas in the migration can 2 becomes high pressure, internal gas was opened wide outside and the pressure buildup is prevented. Moreover, the steamy impregnation valve 5 is formed, a steam can be poured now into the migration can 2, and the air in the migration can 2 is extruded to the flank of the migration can 2 with a steam, and can be permuted now by it. The migration implement 6 which has a migration roller is attached in the bottom section of the migration can 2, and it is made smooth [migration], as shown in drawing 2. As shown in drawing 1, the packing 7 for ring-like prevention [gas leakage] is attached in the lower limit peripheral surface of the migration can 2, the electric shielding container 8 of packing 7 with which the rectangular bottom was wide opened immediately from the upper part is formed, and a tip can be sunk now. In the lower part of the migration can 2, the slide guide 9 of the rectangle covered with the electric shielding container 8 is beginning to be prolonged in the method of outside from the perimeter of the inlet port 11 of the upper part of the dry distillation heating can 10. Even if the tank 12 in which the upper part is opened wide is beginning to be prolonged in the method of outside from the perimeter of the inlet port 11 of the upper part of the dry distillation heating can 10 and the migration can 2 moves like an arrow head in the slide guide 9 bottom. The lower limit section of the electric shielding container 8 serves as die length which can move convenient. It has the depth to which the electric shielding container 8 has always sunk in the water of a tank 12, and the gas of the dry distillation heating can 10 leaks outside, and the inlet port 11 of the dry distillation heating can 10 has structure sealed completely. Even if the migration can 2 moves to the location shown with an alternate long and short dash line by drawing 1, as long as the lid 4 of the migration can 2 has closed, a sealing condition is maintained, the inlet port 11 of the dry distillation heating can 10 always has structure sealed completely, and the open air's also entering thru/or internal gas leak.

[0011] The dry distillation heating can 10 has longwise metal cylinder object 10a, and has an inlet port 11 in the upper part as mentioned above, and has an outlet 13 in the lower part. It is covered by incubation object 10b which consists of a heat insulator, circular ring-like opening 10c is formed among both, the burner 14 is formed in 10d of flanks of incubation object 10b, and the perimeter of metal barrel 10a blows the combustion style accompanied by a flame into opening 10c, and heats sink and metal barrel 10a toward the upper part from a lower part. The discharge pipe 15 is connected to the upper limit section of incubation object 10b, at first, horizontally, next, it begins to extend in the perpendicular upper part, and the combustion style which finished the dry distillation from incubation object 10b can be discharged now outside. The steam generator 16 which is formed so that the discharge pipe 15 may be covered and which has stored water in the lower part is connected with the dry distillation heating can 10 and the discharge pipe 15, and the heat of the combustion style which passes the discharge pipe 15 is used. While generating a steam and supplying a steam to metal barrel 10a of the dry distillation heating can 10 through the steamy impregnation valve 17, the steamy pipe 18, and the steamy impregnation

valve 19 from the upper part. It enables it to supply a steam also in the migration can 2 through the steamy impregnation valve 20, the steamy delivery pipe 21, and the steamy impregnation valve 5 from the upper part. the carbonization gas from the part of metal barrel 10a of the opposite side of the steamy impregnation valve 17 -- a conduit 22 is beginning to be prolonged and carbonization gas and a steam can be discharged now. It is cooled with a syngas cooler 23, and an oily water separating tank 24 separates oily water, it is again cooled with a syngas cooler 23 and the connected syngas cooler 25 through a pipe 27, and this carbonization gas and steam are processed with an oily water separating tank 26, and can take out carbonization gas now from output port 28. Since this carbonization gas can burn, the place of a burner 14 is supplied and it can also carry out recycling.

[0012] The discharge cylinder 30 is horizontally connected to the outlet 13 of the dry distillation heating can 10 in the airtight condition, the right end of the discharge cylinder 30 has bent caudad at the right angle, the tip is sunk by the water of a water tank 31, and air enters. Therefore, dry distillation is performed in the airtight condition. The screw 32 is arranged horizontally at the horizontal level of the discharge cylinder 30, and it is prepared in extent which occupies most the length for a horizontal level of the discharge cylinder 30. The shaft 34 of the motor 33 to which the moderation machine was attached is connected with the left end of this screw 32, and a screw 32 is pivotable. The residua 35, such as carbide generated after dry distillation material is distilled dryly, were extruded rightward, it can deposit now on a water tank 31 as residua 36, and generating of dust is prevented. Water is pumped up from a water tank 31 with high pressure pumping 37, and water is supplied to the spraying valve 39 through a pipe 38. The spraying valve 39 is formed in the upper limit of bending section 30a of the discharge cylinder 30, and sprays from there to a screw 32. The water which sprayed the spraying valve 39 on the direction and opposite direction where residua 35 are extruded, and was sprayed. At the same time it contacts the hot red-hot residua 35 and cools it by heat exchange. While it can become a steam and is pressured upwards toward the upper part from the outlet 13 of the dry distillation heating can 10 furthermore it is heated, becomes superheated steam and is alike by blowing up at a part with the low temperature of the center section of metal barrel 10a, and waste tire 2a will be mostly distilled dryly by homogeneity, and raises dry distillation effectiveness. As shown in drawing 3, the screw 32 has dual structure, has prepared spiral metal cooling dome 32a for letting cooling water flow as the heart, and, thereby, is made not to carry out heat deformation according to the elevated temperature of residua 35. Cooling water is supplied from the cooling water feed zone 40, flows on right-hand side from left-hand side through path 32b, and is dropped outside from a right tip. Incubation object 32c which consists cooling dome 32a of a wrap heat insulator is rolled for making it the temperature of residua 35 not fall by cooling of cooling dome 32a.

[0013] Next, actuation of this example is explained. In the state of drawing 3, a burner 14 is lit, it is made to heat so that delivery and metal barrel 10a may become an elevated temperature about a combustion style at opening 10c, a steam is generated with a steam generator 16, the steamy impregnation valves 17 and 19 are opened wide, and a steam is sent to metal barrel 10a. On the other hand, the steamy impregnation valve 5 is closed and the steam is not supplied to the migration can 2 at this time. While starting a motor 33 and rotating a screw 32 through a shaft 34, high pressure pumping 37 is started, water is supplied to the spraying valve 39, and it sprays on a screw 32. Thus, if dry distillation is ready, the lid 4 of the migration can 2 will be opened, about 100kg will be held for a waste tire, and a lid 4 will be shut. Then, a steam is supplied to the migration can 2 by the steamy impregnation valve 5, the air accompanied to a waste tire is discharged outside from a relief valve 3, and since the air accompanied to a waste tire is permuted by the steam, while having prevented explosion of the dry distillation heating can 10, dry distillation of waste tire 2a is performed with sufficient high rate. Next, after closing the steamy impregnation valve 5, along with a slide guide 9, the migration can 2 is horizontally moved leftward by work of the migration implement 6 of drawing 2, and if it is the location which the migration can 2 and metal barrel 10a open for free passage, waste tire 2a will carry out natural fall of the building envelope of metal barrel 10a, and will be distilled dryly with heat and a steam in the meantime. Moreover, even if the migration can 2 moves like an arrow head, the electric shielding container 8 has sunk in the water of a tank 12, and perfect sealing performance can always be

secured.

[0014] The migration can 2 is again returned to the location of drawing 1, again, the migration can 2 is filled up with waste tire 2a, and it moves even the dry distillation heating can 10. Thus, the migration can 2 will repeat migration right and left and fall of waste tire 2a, and can distill waste tire 2a dryly with sufficient high rate.

[0015] Dry distillation blows the combustion style accompanied by a flame into opening 10c from a burner 14. The combustion style which heated sink and metal barrel 10a toward the upper part from the lower part, and finished the dry distillation from incubation object 10b with the discharge pipe 15 is discharged outside. At that time With the heat of the combustion style which passes the discharge pipe 15, a steam generator 16 generates a steam and supplies a steam to metal barrel 10a of the dry distillation heating can 10 through the steamy impregnation valve 17, the steamy pipe 18, and the steamy impregnation valve 19 from the upper part. carbonization gas -- carbonization gas is discharged from a conduit 22, these gas is cooled with syngas coolers 23 and 25, oily water is separated by oily water separating tanks 24 and 26, and carbonization gas is taken out from output port 28. Only when the migration can 2 closes a lid 4 at the right end after supplying waste tire 2a, a steam is poured into the migration can 2 through the steamy impregnation valve 20, the steamy delivery pipe 21, and the steamy impregnation valve 5.

[0016] Within the discharge cylinder 30, a screw 32 rotates, the residua 35, such as carbide generated after dry distillation material is distilled dryly, are extruded rightward, and it can deposit now on a water tank 31 as residua 36. Dry distillation effectiveness is raised by pumping up water from a water tank 31 with high pressure pumping 37, the water which sprayed on the direction and opposite direction where residua 35 are extruded, and was sprayed contacting the hot residua 35, becoming a steam, pressuring upwards the spraying valve 39 toward the upper part from the outlet of the dry distillation heating can 10, and supplying a part with the low temperature of the center section of metal barrel 10a. Spiral metal cooling dome 32a and this cooling dome 32a can be borne by incubation object 32b which consists of a wrap heat insulator at the elevated temperature of residua 35. Thus, the dry distillation heating can 10 receiving steamy supply from a flank, and discharging exhaust gas from a flank, this example is an air cut off state, and continuously, the vertical part can carry out natural fall of the waste tire 2a, and can distill it dryly.

[0017] As mentioned above, although this example was explained, naturally the configuration of this invention can be suitably changed in the range which does not deviate from the technical thought of this invention. The migration structure of the migration can 1 is not limited to an example, and can be changed suitably. The screw 32 of what is limited to neither the configuration of an example nor the thing of structure, for example, has a shaft like a screw being included is natural. A contact sensing sensor, an ultrasonic sensor, and a photosensor are formed in an inlet port 11, it detects that waste tire 2a was got blocked and caught in the inlet-port 11 neighborhood, and you may enable it to stop the return of the migration can 2.

[0018]

[Effect of the Invention] The longwise dry distillation heating can which established the inlet port of dry distillation material in the upper part, and established the outlet in the lower part as explained above, The heater which supplies the heat for being prepared in the flank of this dry distillation heating can, and distilling said dry distillation material dryly, The steam generator which generates a steam with the heat of the gas from this heater, and supplies a steam to said dry distillation heating can, The migration can which is prepared so that the exhaust air section which discharges carbonization gas from said dry distillation heating can, and said inlet port of said dry distillation heating can may be sealed, and can move to a longitudinal direction and in which the closing motion for a dry distillation material injection is possible, Since the airtight discharge section for connecting with the outlet of said dry distillation heating can, and discharging dry distillation residua was prepared, the injection working efficiency of dry distillation material improves, and dry distillation residua are processed automatically, and the activity chip-ized that what is necessary is just to divide dry distillation material big and rough becomes unnecessary. Since a steam can permute the gas accompanied at the time of the injection of dry

distillation material, while being able to raise safety, carbonization gas with low acidity is obtained, and emission of the dust to the inside of mind can be prevented further.

[0019] Since connect a tank to said inlet port, an electric shielding container is made to extend from said migration can and this electric shielding container is made to come to sink in the water of a tank, airtightness can be secured and dry distillation effectiveness increases.

[0020] Since it comes to prepare the sprayer which the tip of said discharge section is sunk and can spray water on the building envelope of this discharge section, and heating steam is made using the heat of red-hot carbide and this is pressured upwards with the dry distillation heating can, uniform dry distillation is attained in the perimeter and center section of the dry distillation heating can.

[0021] The screw for extruding dry distillation residua is prepared in said discharge section, the rotation driving source for rotating this screw is connected to said screw, and since said sprayer is installed in said discharge section and it becomes so that it can spray on the direction of extrusion and the abbreviation opposite direction of dry distillation residua, uniform dry distillation is attained in the perimeter and center section of the dry distillation heating can.

[0022] Since the screw for extruding dry distillation residua is prepared in said discharge section, the path of cooling water is installed through the interior of this screw and it comes to cover that periphery with heat insulating material, heat deformation of a screw can be prevented and endurance improves.

[0023]

[Translation done.]